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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Sterling Eduard McBride

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12/20/2004

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EXAMINER

WOOD, KEVIN S

ART UNIT

PAPER NUMBER

2874

DATE MAILED: 12/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

gm

<b>Office Action Summary</b>	<b>Application No.</b> 09/925,885	<b>Applicant(s)</b> MCBRIDE ET AL.	
	<b>Examiner</b> Kevin S Wood	<b>Art Unit</b> 2874	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.**

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 September 2004.
- 2a) ☒ This action is FINAL.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☐ Claim(s) \_\_\_\_\_ is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 8 is/are allowed.
- 6) ☒ Claim(s) 3, 5-7, 9 and 11-13, 15-19 is/are rejected.
- 7) ☒ Claim(s) 14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- ✓ 10) ☒ The drawing(s) filed on 01 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **FINAL REJECTION**

### ***Response to Amendment***

1. This action is responsive to the Applicant's Amendment filed on 15 September 2004. Claims 3, 6, 7, and 8 are amended. Claims 2 and 4 are cancelled. New claims 18 and 19 have been added. Claims 3, 5-9 and 11-19 are pending in the application.
2. Based on the Applicant's Amendment, claim 2 has been cancelled and is therefore no longer an improper claim.

### ***Response to Arguments***

3. Applicant's arguments filed on 9 September 2004 have been fully considered but they are not persuasive. The examiner has thoroughly reviewed the applicant's arguments but firmly believes the cited references to reasonably and properly meet the claimed limitations.

Referring to claims 3 and 11, the applicant's primary argument is that U.S. Patent No. 5,699,462 to Fouquet does not disclose all the limitations of the claimed invention. Specifically the applicant argues that the Fouquet '462 reference fails to disclose changing or altering a characteristic of a fluid, where the change in the characteristic is used to controllably direct a light beam from a first waveguide to a second waveguide. The examiner respectfully disagrees with this argument. It is clear within the Fouquet '462 reference that the refractive index of the fluid is changed for the purpose of controllably directing the light beam from a first optical waveguide to a second waveguide. The refractive index of the fluid altered by heating the liquid with a heater

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(84) until the liquid is vaporized. The vapor bubble ends up having a refractive index that is different from the original liquid. It is clear to the examiner that the vaporizing of the fluid, in order to change the refractive index of the fluid, meets the limitation of altering a characteristic of the fluid to controllably direct a light beam from a first waveguide to a second waveguide. It is also clear that a meniscus is formed when the fluid is vaporized. This meniscus would move along the cavity as the vapor bubble expanded, eventually the bubble would be large enough effect light transmission between the waveguides.

Referring to claims 6, 7, 12, 13,15, and 17, the applicant's primary argument is that U.S. Patent No. 5,699,462 to Fouquet does not disclose all the limitations of the claimed invention. Specifically the applicant argues that the Fouquet '462 reference fails to disclose changing or altering a characteristic of a fluid, where the change in the characteristic is used to controllably direct a light beam from a first waveguide to a second waveguide. The examiner respectfully disagrees with this argument. The applicant seems to be misinterpreting the Fouquet '462 reference. The applicant argues that the Fouquet '462 reference moves the fluid in order to control the switching. It is clear within the Fouquet '462 reference that the refractive index of the fluid is changed by heating the fluid with a heater until the fluid is vaporized. The vapor bubble ends up having a refractive index that is different from the original liquid. It is clear to the examiner that the vaporizing of the fluid, in order to change the refractive index of the fluid, meets the limitation of altering a characteristic of the fluid to controllably direct a light beam from a first waveguide to a second waveguide.

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Referring to claim 5, the applicant's primary argument is that U.S. Patent No. 6,487,333 to Fouquet does not disclose all the limitations of the claimed invention. Specifically the applicant argues that the Fouquet '333 reference fails to disclose changing or altering a characteristic of a fluid, where the change in the characteristic is used to controllably direct a light beam from a first waveguide to a second waveguide. The examiner respectfully disagrees with this argument. It is clear to the examiner, that the Fouquet '333 reference, discloses the use of an actuator to move a fluid (404) along a channel (403), to controllably direct a light beam between two optical waveguides (422,423). It is also clear that the actuator controls the pressure acting on the fluid, therefore it controls the shape of the meniscus. It is inherent that when the pressure is increased to move the fluid (404) along the channel (403), the shape of the meniscus would be altered.

4. Applicant's arguments, filed 9 September 2004, with respect to claims 8 and 14 have been fully considered and are persuasive. The rejection claims 8 and 14 have been withdrawn.

### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent

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granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 3, 6, 7, 11-13, 15 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,699,462 to Fouquet et al.

Referring to claims 3 and 11, Fouquet et al. discloses all the limitations of the claimed invention. Fouquet et al. discloses a microfluidic optical switch including: a fluid (90) contained in a reservoir having a characteristic; a first optical waveguide (96) having an end located proximate the fluid; at least one second optical waveguide (94) having an end located proximate the fluid; and an actuator (84) coupled to the fluid for exchanging changing the characteristic of the fluid, wherein the characteristic is a deformable interface formed on the fluid, wherein the deformable interface is a position of the meniscus. See the figures of the reference along with their respective portions of the specification.

Referring to claims 6, 7, 12, 13, 15 and 17, Fouquet et al. discloses all the limitations of the claimed invention. Fouquet et al. discloses a microfluidic optical switch including: a fluid (90) contained in a reservoir having a characteristic; a first optical waveguide (96) having an end located proximate the fluid; at least one second optical waveguide (94) having an end located proximate the fluid; and an actuator (84) coupled to the fluid for exchanging changing the characteristic of the fluid, wherein the characteristic a controllable refractive index gradient. See the figures of the reference along with their respective portions of the specification. Fouquet et al. discloses that the

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actuator (84) heats the fluid (90), causing it to vaporize, the vaporized liquid then has a different refractive index.

7. Claims 5 and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,487,333 to Fouquet et al.

Referring to claims 5 and 19, Fouquet et al. discloses all the limitations of the claimed invention. Fouquet et al. discloses a microfluidic optical switch including: a fluid (404) contained in a reservoir having a characteristic; a first optical waveguide (421) having an end located proximate the fluid; at least one second optical waveguide (422,423) having an end located proximate the fluid; and an actuator (410) coupled to the fluid for exchanging changing the characteristic of the fluid, wherein the characteristic is a deformable interface formed on the fluid, wherein the deformable interface is a position of the meniscus. See the figures of the reference along with their respective portions of the specification. Fouquet et al. also discloses a liquid/liquid interface between liquids (406) and liquid (404). The pressure of the liquid (406) is controlled by the actuator (410), therefore the shape of the interface can be altered by the actuator.

### ***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,487,333 to Fouquet et al.

Referring to claims 18, Fouquet et al. discloses all the limitations of the claimed invention, except Fouquet et al. does not specifically disclose that the actuator is an electrohydrodynamic actuator. Instead Fouquet et al. has a piezoelectric transducer and working fluid to displace the fluid. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize an electrohydrodynamic actuator for displacing the fluid since the applicant has not disclosed that the electrohydrodynamic actuator solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with any suitable fluid displacing device as the actuator.



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***Allowable Subject Matter***

11. Claim 8 is allowed.
12. Claim 14 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

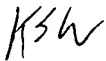
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin S Wood whose telephone number is (571) 272-2364. The examiner can normally be reached on Monday-Thursday (7am - 5:30 pm).


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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney B Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Kevin S. Wood



**AKM ENAYET ULLAH**  
**PRIMARY EXAMINER**